What we know...

How to determine the VERTEX by FACTORING and using the zeros
How to determine the VERTEX by COMPLETING the SQUARE

Students will learn;
How to Solve WORD Problems that require the VERTEX (the MAX or MIN point)

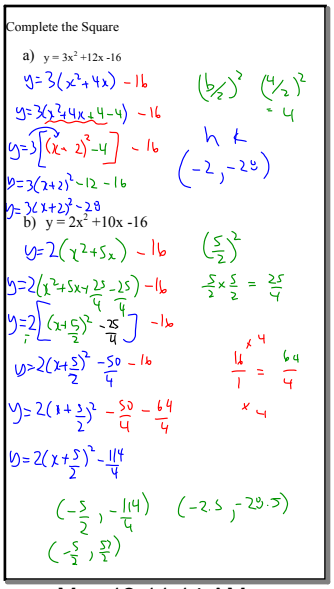
Feb 22-11:43 AM

Complete the Square

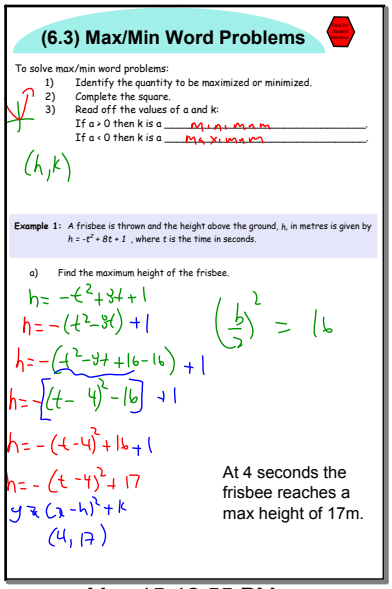
a) $y = 3x^2 + 12x - 16$

b) $y = 2x^2 + 10x - 16$

May 12-11:14 AM



May 12-11:14 AM



May 15-12:55 PM

(6.3) Max/Min Word Problems

To solve max/min word problems:
1) Identify the quantity to be maximized or minimized.
2) Complete the square.
3) Read off the values of a and k:
If a > 0 then k is a _____.
If a < 0 then k is a _____.

Example 1: A frisbee is thrown and the height above the ground, *h*, in metres is given by $h = -t^2 + 8t + 1$, where *t* is the time in seconds.

a) Find the maximum height of the frisbee.

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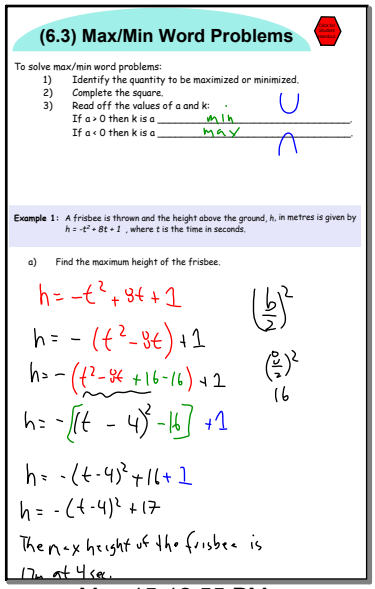

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b) How long does it take the frisbee to reach its maximum height?

c) How long before the frisbee hits the ground? (To one decimal place.)

d) How high is the frisbee above the ground before it is thrown?

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b) How long does it take the frisbee to reach its maximum height?

c) How long before the frisbee hits the ground? (To one decimal place.)

$h = -t^2 + 8t + 1$

$h = -[t^2 - 8t - 1]$ -8 | A | M | -1

nonfactorable

d) How high is the frisbee above the ground before it is thrown?

$t = 0$

1m

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Example 2: Mrs. Owens' back yard is enclosed by fencing. The area of the yard, A, in square metres, is given by $A = 200w - 2w^2$ where w is the width in metres.

a) What is the width of her yard if the area is maximized?

b) What is the maximum area of Mrs. Owens' back yard?

c) What are the dimensions of the yard?

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Example 2: Mrs. Owens' back yard is enclosed by fencing. The area of the yard, A, in square metres, is given by $A = 200w - 2w^2$ where w is the width in metres.

a) What is the width of her yard if the area is maximized?

$A = 200w - 2w^2$ $\left(\frac{100}{2}\right)^2$

$A = -2w^2 + 200w$ 2500

$A = -2(w^2 - 100w)$ (h, k)

$A = -2(w^2 - 100w + 2500 - 2500)$

$A = -2[(w - 50)^2 - 2500]$ (50, 5000)

$A = -2(w - 50)^2 + 5000$

b) What is the maximum area of Mrs. Owens' back yard?

If the width is 50m she will have a maximum area of $5000m^2$

c) What are the dimensions of the yard?

100

$5000m^2$ 50

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Homework

Pg. 331 # 8, 9, 10
& Handout

May 12-7:33 AM

Attachments

Lesson 3 - 6.3 Word Problems.docx